I. Project Title: **INTERAGENCY STANDARDIZED MONITORING PROGRAM — Population Estimate of Humpback Chub in Black Rocks.**

II. Principal Investigator(s):

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III. Project Summary:

The Interagency Standardized Monitoring Program (ISMP) was developed in 1986 to monitor population trends of Colorado pikeminnow and humpback chub in the Colorado River Basin. The original ISMP was composed of three parts: 1) spring electrofishing for subadult and adult Colorado pikeminnow in parts of the Green, Colorado, White and Yampa rivers (about 20 -30% of occupied habitat within each of the rivers); 2) autumn backwater seining for YOY Colorado pikeminnow in the Colorado and Green rivers; and 3) sampling for adult humpback chubs with trammel nets in Black Rocks and Westwater Canyon. These sampling programs relied on changes in catch per effort (CPE) to monitor changes in population size and structure.

ISMP was expanded in 1998 to include mark-recapture population estimates of the major Colorado pikeminnow and humpback chub populations. This report summarizes work done to estimate the population size of humpback chub in Black Rocks, Colorado.

IV. Study Schedule: 1998 – 2001.

V. Relationship to RIPRAP: General Recovery Program Support Action Plan, V.A.1. Conduct Standardized Monitoring Program.

VI. Accomplishment of FY 01 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Tasks

1. Conduct at least three, but no more than four, sampling trips at Black Rocks in late summer and/or early fall.

   Field work is completed for this study. The Colorado River in Black Rocks was sampled in 1998, 1999, and 2000 to estimate size and structure of the humpback chub population located there. Sampling occurred in late summer - early fall after water temperatures began to cool for the year. Three sampling trips were conducted in 1998 and 2000, four trips were made in 1999. Sampling was primarily done with multi-filament trammel nets (1-in inner mesh), although *Gila* captures were supplemented with electrofishing and trap nets in 1998 and with angling in all years. Trammel nets were set in shoreline eddies in early morning and late afternoon. Nets were run at 1 to 2 hr intervals with 2 hrs set as a maximum interval (mean 1.5 hr). All *Gila* were removed from the nets, placed in fresh water and transported to a central processing point.

   All *Gila* were identified as either humpback chub or roundtail, checked for a PIT tag, measured (total length, ± 1 mm), and weighed (± 1 g). Untagged fish were equipped with a PIT tag before release. After handling, *Gila* were placed in a 1.5% salt bath for 0.5–1 min, and released at the common location. About 10% of the total number handled were placed in a live cage and held overnight to assess initial mortality — no overnight mortalities occurred. All fish appeared healthy when released.

2. Prepare annual report briefly summarizing results.

   This document.

3. Suggest modifications to sampling protocol based upon initial results.

   All recommendations should reflect all humpback chub sampling in the different populations and should reflect the combined conclusions of individuals working with mark-recapture population estimates.

4. Complete final report describing size and structure of the adult humpback chub population in Black Rocks.

   The final report is in the final stages of preparation. The following is a summary of results.

Catch rates declined markedly in 2000 compared with 1998 and 1999. A total of 184 humpback chubs were handled in 1998 (number does not include within year recaptures), 293 in 1999 (four trips compared with three trips in other years) and 68 in 2000. Within year recapture rates were about 10%, with overall recapture rates of 30 to 40% (includes multiple recaptures of the same fish during the same sampling trip, recaptures of fish tagged by other investigators or fish tagged in previous years of this study). Recaptures included a total of 15 humpback chubs that had originally been tagged in Westwater Canyon.

Length-frequency distributions of humpback chub were bimodal in all years. Modes were at 230–250 mm and 310–340 mm. Growth of recaptured fish averaged 7 mm per year. There was no significant difference in growth when humpback chubs were partitioned into two size groups based on the length-frequency distribution. All humpback chub were sexed during the last sampling trip of 1999 when an experienced observer was available to sex the fish. The sex ratio was not significantly different from 1:1.

Population estimates were highly variable depending on the model selected to make the estimate. For example, estimates in 1998 ranged from 349 using Jackknife $\mathbf{M_h}$ to 1,495 using Chao $\mathbf{M_h}$. Model $\mathbf{M_o}$ was selected as the 'best' estimator. Using the 'best' model, population estimates for humpback chub in Black Rocks were 948 (95% confidence interval, 603–1,573) in 1998, 921 (723–1,208) in 1999, and 539 (223–1,497) in 2000. Mean for the three years was 803.

VII. Recommendations: Review conclusions and recommendations of all researchers involved in mark-recapture population estimates of humpback chub and devise a sampling regime and schedule for a new monitoring program.

VIII. Project Status: Project is nearing completion. Final report is in final stages of preparation.

IX. FY 01 Budget Status

A.	Funds Provided:	24 K
B.	Funds Expended:	24 K
C.	Difference	0
D.	Publication Charges	0

X. Status of Data Submission: All data have been submitted to the UCRB database.

XI. Signed: C.W. McAda, December 10, 2001